

**SUMMARY OF
TESTIMONY SUBMITTED TO
THE U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEE ON ENVIRONMENT AND HAZARDOUS MATERIALS**

**BY LAWRENCE E. BENGAL, DIRECTOR, ARKANSAS OIL AND GAS COMMISSION AND
CHAIRMAN OF THE INTERSTATE OIL AND GAS COMPACT COMMISSION TASK FORCE ON
CARBON CAPTURE AND GEOLOGIC STORAGE**

Mr. Bengal will testify in his role as Chairman of the Task Force on Carbon Capture and Geologic Storage of the Interstate Oil and Gas Compact Commission (IOGCC). (The IOGCC is the nation's oldest interstate compact.) He will explain why it will be necessary for states to play a major role in the regulation of the storage of carbon dioxide (CO₂) in geological formations and what states are actively doing to prepare themselves for this important role. Mr. Bengal will testify that it is very likely that states will be the on-the-ground-regulators of geological carbon storage. Mr. Bengal in his testimony will make clear why states are well-suited experientially for this role by virtue of their technical expertise regulating oil and natural gas development and ancillary activities, including natural gas storage, acid gas injection and CO₂ enhanced oil recovery. Mr. Bengal will also explain how states, in most instances, are the administrators of the U.S. Environmental Protection Agency Underground Injection Control (UIC) Program. He will close by emphasizing the importance of public support of carbon storage as a strategy for mitigating the impact of global climate change. Key to this support will be public understanding the long history of CO₂ transportation, handling and use (including use to increase domestic oil production). Mr. Bengal will suggest that given the complexities of credits, ownership and usage of CO₂ that a new regulatory paradigm will be useful, one that is based on resource management rather than waste disposal.

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JULY 24, 2008

Good morning. My name is Lawrence Bengal. I am the Director of the Arkansas Oil and Gas Commission and I'm appearing today in my capacity as Chairman of the Interstate Oil and Gas Compact Commission's Task Force on Carbon Capture and Geologic Storage (CCGS). In the 5 years the Task Force has been in existence, its membership has been drawn from IOGCC member state and provincial oil and gas agencies, U.S. Department of Energy sponsored Regional Carbon Sequestration Partnerships, the Association of American State Geologists and industry. The Task Force has also had representatives from the U.S. Environmental Protection Agency (EPA), the U.S. Bureau of Land Management (BLM) and the environmental group Environmental Defense attending as observers.

The member states of the Interstate Oil and Gas Compact Commission (IOGCC) produce more than 99% of the oil and natural gas produced onshore in the United States. Formed by Governors in 1935, the IOGCC is a congressionally ratified interstate compact. The organization, the nation's leading advocate for conservation and wise development of domestic petroleum resources, includes 30 member states, 8 associate states, and 6 international affiliate provinces. The mission of the IOGCC is two-fold: to conserve our

nation's oil and gas resources and to protect human health and the environment during the production process. Our current chairman is Governor Sarah Palin of Alaska.

The purpose of my testimony today is to share with the Committee the experience and conclusions of IOGCC's CCGS Task Force with regard to the geologic storage of carbon dioxide (CO₂). As this committee today explores the topic "Carbon Sequestration: Risks, Opportunities, and Protection of Drinking Water" I hope my testimony will demonstrate to the committee that states have a crucial and important role to play in the regulation of this most promising technology: the geologic storage of CO₂.

Let me begin by noting what may not be completely understood by everyone. In the United States, states are the primary regulators of oil and natural gas production and related activities including natural gas storage, acid gas injection and the injection of carbon dioxide (CO₂) for enhanced oil recovery (EOR). As that which must be regulated in the geologic storage of CO₂ is extremely similar to that which must be regulated in oil and gas production, states thus possess much of the knowledge base and skill sets that will be required of the on-the-ground regulator of CO₂ geologic storage. Additionally, one of the most important functions of the state in regulating oil and natural gas development and related activities is to ensure that in the construction and operation of the wells and ancillary facilities that the state's water resources are protected, including of course, groundwater. Additionally, states are already in most cases the "on-the-ground" implementers of the Underground Injection Control (UIC) Program of the U.S. Environmental Protection Agency (EPA) under primacy jurisdiction granted to states by the EPA.

It is also important to note that much of the state authority to regulate oil and natural gas production and related activities comes from the state's conservation code, which in most cases is based on the IOGCC Model Conservation Code. This means practically that the state codes are very similar to one another and that a company moving from one jurisdiction to another encounters far more legal and regulatory similarities than dissimilarities.

With the advent of the model laws and regulations created by the IOGCC Task Force and released by the IOGCC earlier this year, states now have a resource to begin to develop laws and regulations governing the regulation of carbon geologic storage. At present over 7 states are already well along in this process, having adopted or in the process of adopting such frameworks. This state-based regulatory system will incorporate, as the oil and natural gas regulatory regime does now, EPA requirements under the UIC program as expanded to include the storage of CO₂ along the lines announced by EPA last week. The Department of Transportation's Pipelines and Hazardous Materials Safety Administration (PHMSA) will also play a critical role in ensuring CO₂ pipeline safety. (The states also administer the PHMSA program as a federal-state partnership.) The result will be a combined state and federal regulatory system in the 2010-2011 timeframe that will provide a sound and nationally consistent regulatory framework for the geologic storage of CO₂ in the United States.

Let me now turn to a more detailed review of the Task Force history and its recommendations.

Funded by the U.S. Department of Energy (DOE) and its National Energy Technology Laboratory (NETL), the Task Force has been engaged since 2003 in a two-phase effort relating to the regulation of the geologic storage of carbon. In Phase I, the Task Force undertook a thorough review of the technology of geologic storage and in Phase II developed a model statute and model rules and regulations for the states and provinces to administer regulatory oversight of geologic storage of carbon dioxide (CO₂).

A major conclusion of the Task Force in Phase I was that the geologic storage of CO₂, in addition to conservation, is among the most immediate and viable strategies available for mitigating the release of CO₂ into the atmosphere. It was readily apparent to the Task Force that carbon storage was also not something entirely new and mysterious – but the technological outgrowth of four analogues. These four analogues, in the opinion of the Task Force, provide the technological and regulatory basis for storage of CO₂ in geologic media: 1) naturally occurring CO₂ contained in geologic reservoirs, including natural gas reservoirs; 2) the large number of projects where CO₂ has been injected into underground formations for Enhanced Oil Recovery (EOR) operations; 3) storage of natural gas in geologic reservoirs; and 4) injection of acid gas (a combination of H₂S and CO₂), into underground formations, with its long history of safe operations.

It was the opinion of the Task Force that given the jurisdiction, experience, and expertise of the states and provinces in the regulation of oil and natural gas production as well in regulating the analogues identified above, the states and provinces would not only be well able to regulate, but would be the most logical and experienced on-the-ground regulators of CO₂ geologic storage. Additionally and importantly, the oil and natural gas producing

states and provinces are strategically and geologically well-situated for the geologic storage of CO₂. Regulations already exist in most oil and natural gas producing states and provinces covering many of the same issues that will need to be addressed in the regulation of CO₂ geologic storage, and consequently serve as adaptable frameworks.

Given these Phase I conclusions, the Task Force, in Phase II, began work and in September of 2007 produced, for the first time, a clear and comprehensive model legal and regulatory regime for the geologic storage of CO₂. Utilizing these model regulatory frameworks, states and provinces, and indeed other nations, have the basic building blocks to begin immediately the process of developing and enacting legislation and promulgating rules and regulations enabling CO₂ geologic storage projects. Wyoming, Washington, Kansas, California, New Mexico, North Dakota, and Texas are, among other states, in various stages of developing such a legal and regulatory framework. Wyoming passed legislation this year relying heavily on the IOGCC model.

I anticipate that by 2010 there will be at least 7-15 states, encompassing much of the country best suited for carbon geologic storage, with legal and regulatory systems in place for the regulation of geologic storage of CO₂. The recently proposed EPA carbon storage regulations under the Safe Drinking Water Act and its implementing UIC program should also be in place by 2011.

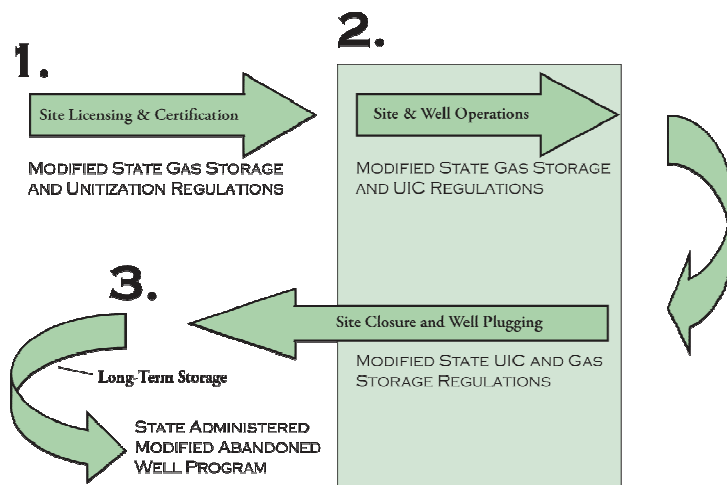
Let me now briefly address how the IOGCC anticipates that the EPA's CO₂ geologic storage regulations will interface with the regulatory systems being developed by the states. Given the incorporation of UIC-like regulatory requirements into the proposed

IOGCC model regulatory frameworks, there is every reason to anticipate that the IOGCC and EPA frameworks will fit like hand in glove. This is largely because of the role that states play in the administration of UIC programs under EPA state primacy authority.

As we've heard this morning, the EPA has been in the process of developing regulations for geologic sequestration under the Safe Drinking Water Act. Draft regulations were announced last week. The IOGCC at the invitation of EPA had two representatives, Berry "Nick" Tew of Alabama and myself, actively participating in the process as state co-regulators. States with primacy already play an integral role in administering the UIC program and under future rules governing geologic storage, are likely to do so again. Having representatives from states involved in the process helps insure compatibility between the state and federal components of geologic storage regulatory oversight.

What is clear to me, especially given my involvement with the current EPA workgroup, is that the state regulatory system for carbon storage proposed by the IOGCC Task Force will in all likelihood work seamlessly with the regulations likely to emerge out of the EPA regulatory development process.

It is now appropriate to supply a little more detail about the legal and regulatory system which the IOGCC Task Force has proposed for the geologic storage of CO₂ and how, precisely, the proposed EPA regulatory system for CO₂ storage would likely fit into this system. This diagram will be helpful:



The diagram represents the “cradle to grave” regulatory model which the Task Force has recommended to states. There are three phases.

1. Licensing including amalgamation of Storage Rights

The first phase is the licensing phase which includes the critical requirement that the project operator control the storage rights.

The Task Force concluded that as a part of the initial licensing of a storage project that the operator of the project must control the reservoir and associated pore space to be used for CO₂ storage. The operator would need to acquire these rights from the owners or assume those rights by means of eminent domain, unitization or some other vehicle that either exists in a state or would be created by the state uniquely for this purpose. This step is necessary because in the U.S., the right to use reservoirs and associated pore space is considered a private property right and must be acquired from the owner. It was the conclusion of a Task Force legal subgroup that in most U.S. states, for non EOR-related

storage, the owner of these rights would likely be the owner of the surface estate. It may be prudent, however, depending upon the specific property right ownership framework in a given state, for an operator to also control the relevant subsurface mineral rights.

Additionally, as part of the initial licensing of a project the operator would be required to submit for State Regulatory Authority (SRA) approval, detailed engineering and geological data along with a CO₂ injection plan that includes a description of mechanisms of geologic confinement that would prevent horizontal or vertical migration of CO₂ beyond the proposed storage reservoir. The operator would also be required to submit for approval by the SRA a public health and safety and emergency response plan, worker safety plan, corrosion monitoring and prevention plan and a facility and storage reservoir leak detection and monitoring plan.

The rules also include requirements for an operational bond that would be sufficient to cover all operational aspects of the storage facility excluding wells which would be separately bonded.

Site licensing and amalgamation of storage rights is generally believed to be outside the scope of the current UIC Program, and given that regulatory involvement with property rights is a state issue, this phase is best addressed at the state level. In addition, given the likely competition for acceptable storage sites, it is in a state's interest to manage these sites to maximize storage capacity and resolve any operator conflicts over the right to use storage resources, thereby maximizing the state's best economic interest in providing storage sites for that state's generators.

2. The Storage and Closure Phase

In this second phase we are talking about the phase, following initial licensing, when the storage project is developed, operated, and closed. This includes a short time period following plugging of the wells during which time the project is monitored to ensure stability of the injected CO₂.

During the storage component of this phase the model rules specify the procedures for permitting and operating the project injection wells to safeguard life, health, property and the environment. The operator would be required to post individual well bonds sufficient to cover well plugging and abandonment, CO₂ injection and/or subsurface observation well remediation. The rules also specify design standards to ensure that injection wells are constructed to prevent the migration of CO₂ into other than the intended injection zone. Provisions in the rules also ensure that all project operational standards and plans submitted during the licensing phase would be adhered to and that the project and wells are operated in accordance with all required operating parameters and procedures. Quarterly and annual reports would be required throughout the operational life of the project. The rules also ensure that the wells are properly plugged and the site restored. The individual well bonds, maintained during the operational phase of the project would be released as the wells are plugged.

The closure component of this phase is defined as that period of time when the plugging of the injection wells has been completed and continuing for a defined period of time (10

years unless otherwise designated by the State Regulatory Authority) after injection activities cease and the injection wells are plugged. During this closure period, the operator of the storage site would be responsible for providing the required data to ensure the injected CO₂ has not migrated beyond the project boundaries and the injected CO₂ plume has been stabilized. During this time the operator is required to maintain an overall project operational bond.

This phase is primarily where the EPA's proposed carbon storage rules will supplement state rules so as to ensure the operation and plugging of the wells are protective of the groundwater resources under the UIC Program.

3. Long-Term “Care Taker” Phase (long-term monitoring and liability)

This last phase is the Long Term or Post-Closure Period and is characterized as that period of time when the operator of the project is no longer the responsible party and the long-term “care taker” role is assumed by a government entity or government-administered entity. The major issue faced by the Task Force was how to deal with long-term monitoring and liability issues. The formula settled upon by the Task Force is the following:

At the conclusion of the Closure Period, the operational bond would be released and the regulatory liability for ensuring that the site remains a secure storage site would transfer to a trust fund administered by the state. During the Post-Closure Period, the financial resources necessary for the state or a state-contracted entity to engage in future monitoring,

verification, and remediation activities would be provided by this state-administered trust fund.

The Task Force concluded that such a state-administered trust fund would be the most effective and responsive “care-taker” to provide the necessary oversight during the Post-Closure Period. The trust fund would be funded by an injection fee assessed to the site operator and calculated on a per-ton basis.

In summary, the EPA Regulations under the SDWA and the UIC Program will primarily deal with the Storage and Closure Phase as illustrated by the green box in the diagram, for it is only in the project areas within that box that EPA has authority under the SDWA. In addition to EPA’s mandate to protect drinking water under the SDWA, the IOGCC regulations cover other public health and safety issues that need to be a part of a comprehensive regulatory framework. As previously stated, almost all of the well operational standards proposed in the IOGCC model regulations are already UIC requirements of one form or another.

What I anticipate is that the proposed EPA regulations, whatever they end up being, will yield a set of uniform national standards, which superimposed on whatever state regulations may be in place will result in national consistency of application so as to ensure that drinking water resources are protected. Again as previously stated, given most states (those with primacy) already administer the existing UIC program, they will continue to do so, conforming their state regulations as they pertain to the geologic storage of carbon to the minimum standard set by the new EPA regulations.

Unless the EPA regulations end up being unnecessarily proscriptive and onerous, the systems should work together perfectly and as I've already stated, "seamlessly". Certainly this is the hope and current full expectation of the IOGCC.

I will note that with regard to federal lands (surface and/or mineral interests), that federal regulations emanating out of the BLM will undoubtedly be necessary. However, what emanates out of BLM would in all likelihood be more akin to what the states have done with regard to state and private lands rather than an overarching and broader national regulatory scheme.

Additionally, our model regulatory system does not address the regulatory issues involving CO₂ emissions trading and accreditation for the purpose of securing carbon credits. The Task Force concluded that the issue of CO₂ emissions trading and accreditation would likely best be addressed in the marketplace and/or at the federal government level and was beyond the scope of the Task Force's mandate. In any event, the Task Force strongly believes that development of any future CO₂ emissions trading and accreditation regulatory frameworks should utilize the experiences of the states.

As concerns long term "care taker" liability, what the Task Force has proposed will have to be addressed by each state and province as they develop their own framework. It remains to be seen if states will agree with the Task Force or propose something new. There may indeed be a need for a federal role here at some point in the future but it is suggested that federal action in this area await a clear need manifesting itself in the years ahead.

Additionally and very importantly, states and provinces are likely to continue to regard CO₂ geologic storage reservoirs as a valuable resource that should be managed using resource management frameworks, therefore avoiding the treatment of CO₂ storage as waste disposal. In this context, the Task Force believes that CO₂ should not be classified as a hazardous substance or pollutant under existing regulatory frameworks. Given the complexities of credits, ownership and usage of CO₂, a new regulatory paradigm is needed based on resource management rather than waste disposal. The Task Force strongly believes that treatment of CO₂ as a waste under waste management regulatory frameworks will diminish significantly the potential of carbon storage technology to meaningfully mitigate the impact of CO₂ emissions on the global climate. The energy consuming public and the industry which produces that energy share a common goal in coming up with a workable solution.

Let me close by noting the obvious -- that public support for carbon storage as a strategy for mitigating the impact of global climate change will be crucial. It will be important to educate the public about this technology including CO₂'s long history of being transported, handled, and used in a variety of applications. As such it will also be vitally important to include the public in every step of the regulatory development process, state and federal. State open meeting laws will ensure public notice and participation in the state process at both the legislative and regulation development stages.

Thank you for the opportunity to appear here today. If I can provide any additional information, please do not hesitate to ask. I would also ask that a copy of the full IOGCC Task Force Report be included in the record today.